

## SAFE DISTANCE GUARD SYSTEM FOR BLINDS

Shubham Raj Gupta<sup>1</sup>, Utkarsh Singh<sup>2</sup>, Utsav Srivastava<sup>3</sup>, Utkarsh Singh<sup>4</sup>

<sup>1,2,3,4</sup> Department of Electronics & Communication Engineering, IMS Engineering College, Ghaziabad, Uttar Pradesh, India

**Abstract** - What is technology? Technology is application of scientific knowledge for practical purpose. Technology is involving each and everyday for making existing life better. A statistical report states that there are around 39 million people who are blind. These are those people who face difficulty in working out their day to day life process. With the latest technology it is possible to support the blind people to face their problem easily. Usually blind people carry a white stick which helps them to convey the path. With the latest technology, we can advance the blind using sensor, microcontroller and other to make a highly efficient stick which will help them and sort out the day to day life work.

**Key Words:** GPS, Transistor BC547, Piezo Buzzer, AT89S52 microcontroller, Sensors.

### 1. INTRODUCTION

According to the W.H.O. reports, there are about 285 million people who are usually impaired and 39 million people who are blind. These proper purposes to design a blind stick which is highly advance. This advance stick has multiple sensors, microcontroller which helps the blind people to cross there day to day life process easily. It will easily detect the obstacles and find a easy path to their journey. Many people suffer from serious visual impairments preventing them from travelling independently. Accordingly, they need to use a wide range of tools and techniques to help them in their mobility. One of these techniques is orientation and mobility specialist who helps the visually impaired and blind people and trains them to move on their own independently and safely depending on their other remaining senses.

### 2. COMPONENT AND HARDWARE USED

Ultrasonic Sensor, Ultrasonic Level Sensor, Flame Detector Sensor, Global Positioning System (GPS), Piezo Buzzer, Transistor BC547, Microcontroller.

### 3. BLOCK DIAGRAM

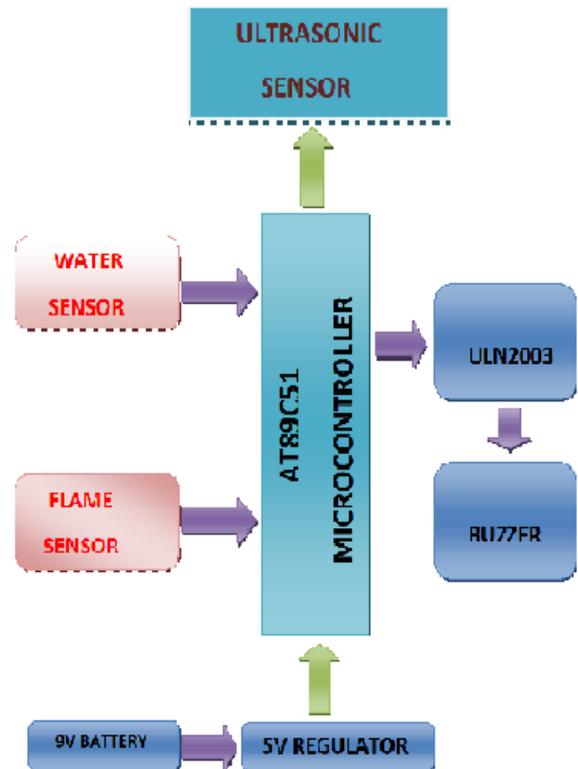


Fig-1: Block Diagram of Experiment

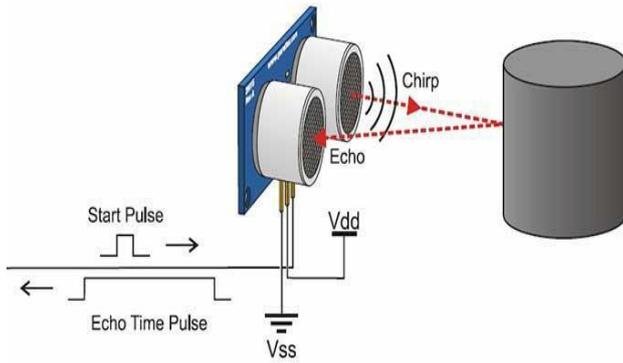
### 4. SPECIFICATION OF COMPONENTS

#### 4.1. ULTRASONIC SENSOR

It is a device that cans measure the distance to an object by using stand sound waves. It records the elapsed time between the sound wave being generated and the sound wave bouncing back. It will continuously sense the obstacles in the path of person and if sensor receives any obstacles wave the will directly send a confirming signal to the microcontroller and will activate the buzzer to stop the person.

It is possible to calculate the distance

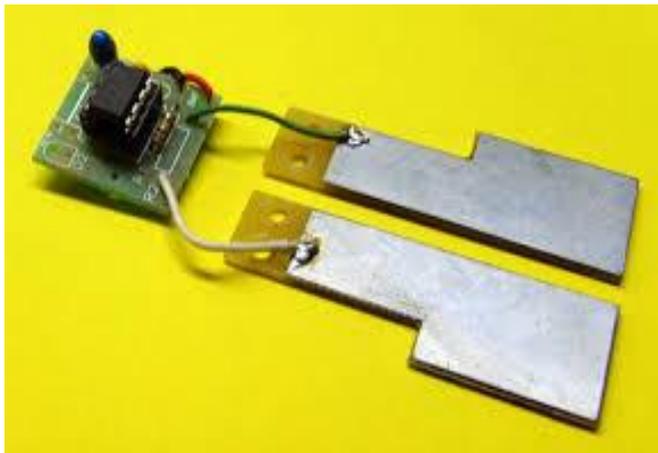
$$\text{Distance} = (\text{Time} \times \text{Speed of Sound}) / 2.$$



**Fig-2:** Ultrasonic Sensor

#### 4.2. WATER DETECTOR SENSOR

This sensor is generally used for measuring bulk solid such as sand, cement, plastic pellets as well as liquid with high viscosity such as slurries, heavy oil, grease etc. If a person is subjected to a maintenance road and he can easily detect obstruction and can change the path.



**Fig-3:** Water Detector Sensor

#### 4.3. FLAME SENSOR

This sensor is used to detect the fire source and other light source where wavelengths range from 760nm-1100nm. The sensor is sensitive to infrared radiation. It has a fast response time and is easy to use.



**Fig-4:** Flame Sensor

#### 4.4. GLOBAL POSITIONING SENSOR (GPS)

The stick contains GPS and audio output system. The stick has GPS along with a memory card. The person can set the location and GPS will guide the person and let them know how much distance is left to reach the destination.



**Fig-5:** Global Positioning Sensor (GPS)

#### 4.5 PIEZO BUZZER

A piezo buzzer is an audio signalling device which may be mechanical, electromechanical and piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.



**Fig-6:** Piezo Buzzer

#### 4.6. MICROCONTROLLER

AT89C51 is an 8 bit microcontroller and belongs to 8051 family. It has 4KB of flash programmable and erasable read only memory and 128 bytes of RAM.

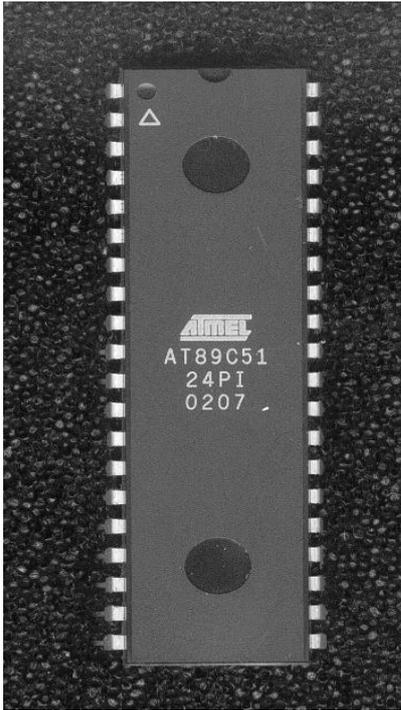


Fig-7: Microcontroller

## 6. CONCLUSION

The day to day travelling problem of a blind person can be sorted out and they can walk in a more efficient way and will help them to be independent.

## 7. REFERENCES

1. "International Journal Volume 96 - no. 25 June 2014 Title- Blind Stick Based On Wireless Sensor Network - State of Art", Author - Kalpana Sharma, Jagdish Kumawat, Saurab Maheshwari, Neeti Jain.
2. [https://en.wikipedia.org/wiki/Atmel\\_AT89\\_series](https://en.wikipedia.org/wiki/Atmel_AT89_series)
3. Tarek Mohammad, "Using Ultrasonic Sensors for Distance Measurement", World Academy of Science, Engineering and Technology 27 2009.
4. National Disability Policy: A Progress Report -October 2014, National Council on Disability, Oct 2014

## 5. EXPERIMENTAL SETUP

The stick works as follows when a blind person will walk with a stick and if the ultrasonic sensor senses an object under its range, it will send an acknowledgement to the microcontroller and thus the buzzer will buzz and the person has to know to change the path. Similarly, if the sensor senses a fire source, then the sensor will acknowledge to the Microcontroller and then the buzzer activate. Similarly, if the person walks on a road where there is a large water level or grease material, thus buzzer activates. The stick also has a GPS system which will continuously guide the blind person of the distance and direction.



Fig-8: Experimental Setup